ABSTRACT OF THE DISCLOSURE

A method and apparatus for joint equalization and decoding using a search-based decoding algorithm on a channel exhibiting intersymbol interference distortion is described. A sequence of information bits is encoded and modulated wherein a finite state machine described with a tree structure is implemented. The information bits are transmitted over a transmission channel having a finite impulse response. At the receiving end, a sequential decoding algorithm is used to retrieve the sequence of information bits. In one example embodiment, a Fano sequential decoder emulates the cascade of finite state machines formed by the trellis code and the channel finite response characterization to determine encoded symbols as prescribed by the path through the various branches of the tree in response to computed metrics. The distance metrics determine the path through the tree that best matches the received symbols.